
Evaluation of Patients' Nursing Care Outcomes Following Thrombolytic Therapy - a Retrospective Study

¹ Josipa Kurtović

² Biserka Sedić

² Biljana Kurtović

¹ Dina Veseli

¹ Department of Neurology, „Dr. Ivo Pedišić“ General Hospital, Sisak, Croatia

² University of Applied Health Sciences, Zagreb, Croatia

Article received: 28.05.2018.

Article accepted: 17.07.2018.

Author for correspondence:

Josipa Kurtović

Department of Neurology, „Dr. Ivo Pedišić“ General Hospital
Josipa Jurja Strossmayera 59, Sisak, Croatia

E-mail: josipakurtovic@yahoo.com

DOI: 10.24141/2/2/2/1

Keywords: nursing, documentation, outcomes, thrombolysis

Abstract

Introduction. Nursing documentation is an indicator of healthcare quality. After extensive data analysis, it has been shown that nursing documentation has become an assessment tool and a tool to change clinical practice. Stroke is the most significant individual cause of disability in the adult population. In instances of ischemic stroke, brain circulation is abruptly disconnected. Causes of this break in blood flow may be blockage or compression of blood ves-

sels due to thrombosis, embolism or systemic hypoperfusion. Therapy administered in cases of acute ischemic stroke includes intravenous thrombolytic therapy - recombinant tissue activator of plasminogen within 180, i.e. 270 minutes of the stroke.

Aim. To determine the quality of outcomes as regards patient care after administering thrombolytic therapy in a display of progress notes of patients' condition during their stay in the hospital, both before and after administering thrombolytic therapy.

Methods. A retrospective study was carried out at the neurology department of „Dr. Ivo Pedišić“ General Hospital in Sisak during 43 months from January 1, 2013 to May 31, 2017. 85 patients participated in the study. Data were obtained from one component of nursing documentation in electronic form, namely progress notes on the patients' conditions.

Results. With a 95% confidence level, a statistically significant difference ($p < 0.05$) was found for parameters of hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Braden scale and categorization, before and after thrombolytic therapy. Statistical significance was not found in the parameters of pain ($p = 0.067$), GCS/Trauma score scale ($p = 0.339$), risk of fall ($p = 0.072$).

Conclusion. The implementation of the healthcare process, continued monitoring of the patient's condition and progress, as well as validation of nursing activities provide an imperative for the application of nursing documentation as an essential tool in describing regular nursing activities. Application of documentation enables a more permanent insight into a patient's general state, data availability, care continuity, progress chronology and result evaluation, as well as a material background for professional, expert and scientific development of nurses through studies in the field of nursing.

Introduction

In a year, around 17 million people around the world suffer a stroke, with 6 million dying of the consequences caused by a stroke. One third of all stroke survivors have a certain level of temporary disability to function independently on a daily basis, one third recovers and one third stays permanently disabled (1). As many as 1 in 6 persons aged 15-60 are at risk of suffering a stroke (2). Considering population's aging, it is estimated that by 2020 stroke will be the leading cause of loss of health (3).

Stroke is the single largest individual cause of disability in adult population. If a person has already survived a stroke, it is highly likely that a potential second one will either be fatal or cause a high level of disability (4). According to statistical data, every year approximately 750 thousand people suffer a stroke in Europe, and the number is similar in the United States of America. Stroke is a major health issue, not only in developed, but also in developing countries (5). Stroke has been both the leading cause of mortality and the leading cause of disability in the Republic of Croatia in the last few years. Stroke is not only a health problem, it is also a major economic and socio-economic problem. In the Republic of Croatia, about 25 thousand people per year suffer a stroke, and 8 thousand die from a stroke, meaning that alongside coronary conditions, it is one of the leading causes of mortality (6). World Health Organization defines a stroke as "suddenly developing clinical signals of focal or global disruption of cerebral function, with symptoms lasting 24 hours or longer, or leading to death, without an evident other cause apart from signs of blood vessels damage" (7). 75 to 80 percent of all strokes are caused by a clot in blood vessels (8).

In instances of ischemic stroke, brain circulation is abruptly disconnected. Causes of this break in blood flow may be blockage or compression of blood vessels due to thrombosis, embolism or systemic hypoperfusion (9). The remaining 20-25 percent of cases of stroke are caused by various forms of blood hemorrhaging prompted by a rupture in one of the brain's blood vessels due to high blood pressure, natural weakness in the wall of the blood vessels or artery-vein malformation (10). A hemorrhaging stroke indicates blood pooling within the brain tissue or areas

surrounding it. According to localization, we can differentiate bleeding within the cerebral parenchyma when smaller arteries are prone to arteriosclerosis and epidural, subdural and subarachnoid bleeding (11). Stroke is a multi-factor condition caused by a combination of vascular risk factors, the environment and genetic predisposition. Stroke risk factors can be divided into those we have the capacity to influence and those we cannot control (12,13). Stroke presents a medical emergency. Therapy administered in cases of acute ischemic stroke includes intravenous thrombolytic therapy - recombinant tissue plasminogen activator within 180, i.e. 270 minutes of the stroke and under the condition it meets the criteria of NIHSS (*National Institute of Health Stroke Score*) (14-17). Plasmin is an enzyme which dissolves fibrin, a protein which constitutes the main part of the blood clot. In that way circulation is re-established and nerve cells dying prevented. The objective of thrombolytic therapy is to re-establish circulation, i.e. reperfusion of the ischemic area (8).

In June 1996 a recombinant tissue plasminogen activator (rt-PA) became the first drug approved by the FDA (Food and Drug Administration) for the treatment of stroke. It has been proven that the drug is efficient only within the 180 minutes from the first symptoms, making stroke a medical emergency (18). The short time period to administer the drug demands a fast assessment of patients who are suspected of suffering a stroke. Two-stage research on the utility of the intravenously administered thrombolytic therapy was completed in 1995 and in the same year the results were published in the National Institute of Neurological Disorders and Stroke, (NINDS) in the United States of America (19).

Both research stages included 624 respondents who were administered either thrombolytic therapy (0.9 mg/ kg) or a placebo within three hours of the first symptoms. The research showed that the patients who were given thrombolytic therapy had a significantly higher likelihood of functional independence with minimum or no disability within three months of the treatment. The share of patients with minimum or no disability grew from 38 percent of placebo patients to 50 percent of those administered rt-PA, indicating a 12-percent increase in improved condition. Intracerebral haemorrhaging connected to administering rt-PA caused a worse final outcome in only 1 percent of all patients. In total, in every 100 patients treated in the first three hours, 32 had a better out-

come and 3 a worse outcome (20). In a typical medial cerebral arterial ischemic stroke, a person loses 2 million nerve cells in one minute unless reperfusion is accomplished (21). The analysis of 3670 patients included in the first eight rt-PA studies provided clear and plausible evidence as regards dependence on the time of administering thrombolytic therapy. Treatment in the first 90 minutes increases the likelihood of an excellent outcome by 2.6 times, in the therapy window of 91-180 minutes by 1.6 times, and in the therapy window of 181 to 270 minutes 1.3 times, while treatment in the 271 to 360 minutes does not improve outcomes in a statistically relevant way. Thus, the sooner therapy is administered, the better the outcome for the patient (20). Patients who meet the criteria for rt-PA treatment within 3 hours of the beginning of stroke should be treated as recommended in the guidelines from 2007. In May 2009 and again in March 2013 the guidelines by the American Heart Association/ American Stroke Association for administering rt-PA after an acute stroke have been revised so as to open up the window for treatment from 3 to 4.5 hours with the objective of enabling drug administration to a greater number of patients (22-24). Patients who meet the condition should be administered rt-PA therapy as soon as possible, ideally 60 minutes upon arrival to the hospital (15).

The application of nursing documentation during patients' hospitalization ensured the possibility of monitoring both the quantity and quality of treatments administered, especially the possibility of permanently monitoring a patient's condition. Without records on nurses' interventions it would be extremely difficult to evaluate healthcare and treatments during hospital stay. Respective parts of nursing documentation provide grounds for continued care and timely involvement of domiciliary care and healthcare activities at home. Nursing documentation also presents a sum of data which can be utilized for the purposes of research (25). Nurses' interventions on patients who had been administered thrombolytic therapy, apart from enabling a high level of treatment safety, greatly affect the quality level of patients' condition during hospitalization, of which there is no previous evidence found in nursing research in the Republic of Croatia. This has been established by searching *Hrčak*, the Croatian scientific journal portal, by using keywords *nursing documentation, outcomes, thrombolysis*. Pursuant to analysing summary parameters

of progress notes for monitoring patients' condition, this paper investigates the quality of outcomes of patient care after the administration of thrombolysis therapy.

Methods

The retrospective study was conducted by analysing the electronic forms of 85 nursing notes of patients who were administered thrombolytic therapy. The study was carried out at the neurology department of „Dr. Ivo Pedišić“ General Hospital in Sisak from January 1, 2013 to May 31, 2017. The study was founded on the hypothesis that there is a significant difference in the amount of necessary nursing care after the administration of thrombolytic therapy.

Statistical analysis of the patient condition notes before and after thrombolytic therapy was carried out. Data gathered in the study is data of the patient condition notes entered into the electronic nursing documentation just moments before thrombolytic therapy was administered. Data collected for the needs of the study after thrombolytic therapy was administered relates to data entered into the electronic nursing documentation at patients' discharge independently of the duration of their hospital stay. The patient condition notes contain the following parameters: hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Glasgow coma scale (GCS)/ Trauma score scale, Braden scale, risk of fall and categorization. The parameters have been assessed in accordance with the descriptions as listed in the Nursing List of the Croatian Nursing Council (26). The testing was conducted using the Wilcoxon test of equivalent pairs for the purpose of establishing ranking values of observed groups. Nonparametric statistic was selected, considering the sample <100.

The study was approved by the Ethical Committee of „Dr. Ivo Pedišić“ General Hospital in Sisak.

Results

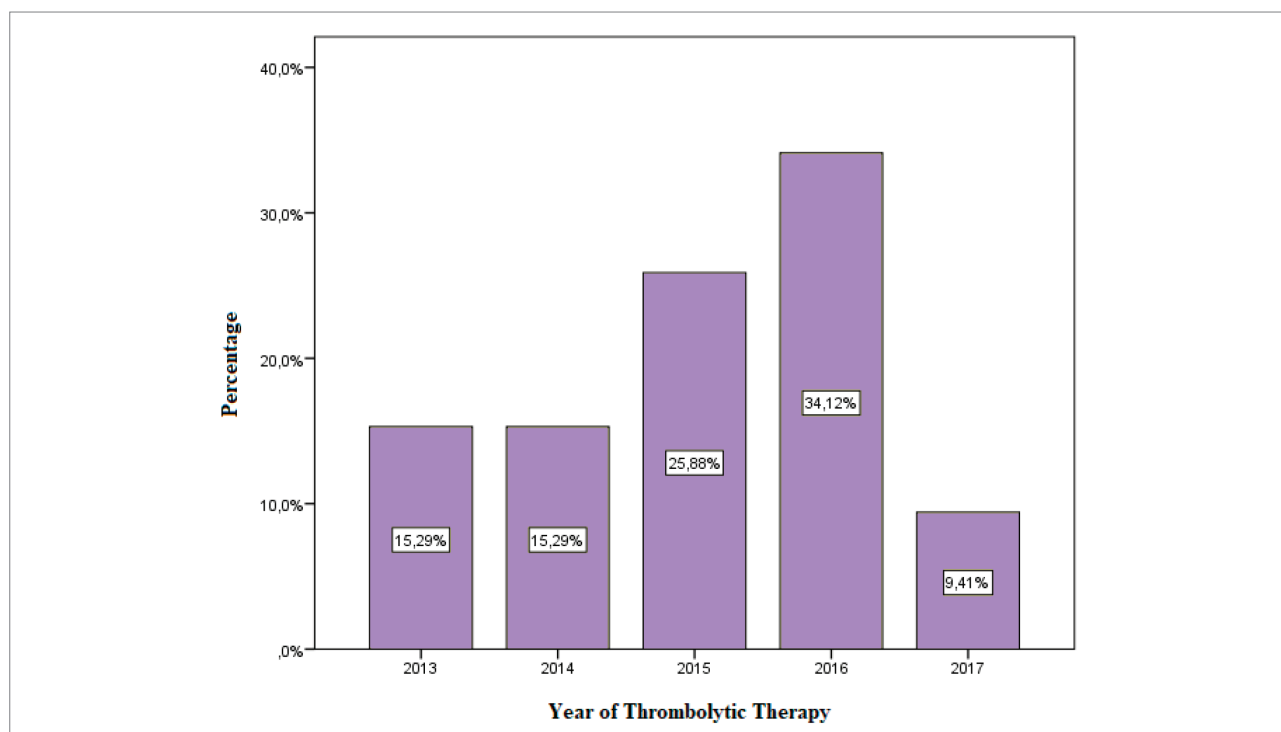
Statistical analysis of electronic forms of 85 nursing lists for patients who were administered thrombolytic therapy determined that the average age of patients is 67.2 years with SD =10.86 years with minimum age 25 and maximum age 87. Gender distribution of respondents is 61.2% of male patients and 38.8% female.

Analysis of the data on the total number of thrombolysis administered throughout the years indicates that 15.3% of thrombolysis was conducted in 2013 and 15.3% in 2014. A rise in the number of thrombolysis administered was noticed in 2015 and 2016. Of the total number of thrombolysis administered, 25.9% was administered in 2015 and as many as 34.1% in 2016. In the first five months of 2017 9.4% of the total number of thrombolysis was administered, as shown in Graph 1.

Table 1 demonstrates a statistical analysis of parameters of patient condition notes during hospitalization, and before thrombolysis, where the highest value \bar{x}

was determined for parameters of Walking - Before \bar{x} = 3.52, SD = 0.63 and Risk of fall - Before \bar{x} =3.49, SD = 0.77. The lowest value \bar{x} was determined for GCS/ Trauma score scale - Before where \bar{x} = 1.59, SD 0.62 and Braden scale - Before where \bar{x} = 2.68, SD = 0.79. Analysis of parameter Strain tolerance - Before determined that 82.4% of patients do not tolerate strain, while 17.6% of patients can tolerate strain. Analysis of parameter Strain tolerance - After determined that 63.5% of patients do not tolerate strain, while 36.5% of patients can tolerate strain. Statistical analysis of parameters of patient condition notes during hospitalization and after thrombolysis the highest value \bar{x} was determined for parameters Hygiene - After where \bar{x} = 2.71, SD 1.16; Dressing - After where \bar{x} = 2.67, SD = 1.21, Walking - After where \bar{x} = 2.67, SD = 1.26. The Lowest value \bar{x} was determined for parameters: GCS/Trauma score scale - After where \bar{x} = 1.53, SD = 0.72; Braden scale - After, where \bar{x} = 2.19, SD = 1.03.

Table 2 demonstrates ranks and test statistics of differences between the first and second measurements of Wilcoxon test. Negative ranks describe parameter values which at result testing after thrombolysis were lower than parameter values before thromboly-



Graph 1. The number of thrombolytic therapies administered from January 2013 to May 2017

Table 1. Descriptive statistics of patient condition notes parameters

PARAMETER		N	\bar{x}	SD	Min	Max
Hygiene	Before	85	3.48	0.62	2	4
	After	85	2.71	1.16	1	4
Feeding	Before	85	3.32	0.77	1	4
	After	85	2.52	1.25	1	4
Elimination	Before	85	3.40	0.69	1	4
	After	85	2.60	1.20	1	4
Dressing	Before	85	3.47	0.64	2	4
	After	85	2.67	1.20	1	4
Walking	Before	85	3.52	0.62	2	4
	After	85	2.67	1.25	1	4
Moving	Before	85	3.41	0.71	2	4
	After	85	2.56	1.22	1	4
Sitting	Before	85	3.27	0.86	1	4
	After	85	2.47	1.25	1	4
Standing	Before	85	3.48	0.68	1	4
	After	85	2.62	1.23	1	4
Turning	Before	85	3.28	0.82	1	4
	After	85	2.48	1.25	1	4
Nutrition/ Diet	Before	85	3.24	0.86	1	4
	After	85	2.52	1.23	1	4
Strain tolerance	Before	85	0.18	0.38	0	1
	After	85	0.36	0.48	0	1
Pain	Before	85	0.56	1.68	0	8
	After	85	0.27	1.11	0	6
GCS/ Trauma score scale	Before	85	1.59	0.62	1	4
	After	85	1.53	0.71	1	4
Braden scale	Before	85	2.68	0.79	1	4
	After	85	2.19	1.02	1	4
Risk of fall	Before	85	3.49	0.76	1	4
	After	85	3.67	0.73	1	4
Categorization	Before	85	3.28	0.66	2	4
	After	85	2.53	1.11	1	4

Table 2. Ranks and test statistics of differences between the first and second measurements of the Wilcox test

Ranks and test statistics	Hygiene After/Before	Feeding After/Before	Elimination After/Before	Dressing After/Before	Walking After/Before	Moving After/Before	Sitting After/Before	Standing After/Before	Turning After/Before	Nutrition/ Diet After/Before	Strain tolerance After/Before	Pain After/ Before	GCS/ Trauma score scale After/Before	Braden scale After/Before	Risk of fall After/Before
Negative ranks	44 ^a	44 ^a	46 ^a	43 ^a	43 ^a	45 ^a	47 ^a	44 ^a	44 ^a	40 ^a	4 ^a	7 ^a	14 ^a	30 ^a	9 ^a
Positive ranks	5 ^b	5 ^b	6 ^b	6 ^b	5 ^b	5 ^b	6 ^b	6 ^b	6 ^b	7 ^b	20 ^b	1 ^b	8 ^b	3 ^b	20 ^b
Equal ranks	36 ^c	36 ^c	33 ^c	36 ^c	37 ^c	35 ^c	32 ^c	35 ^c	35 ^c	38 ^c	61 ^c	77 ^c	63 ^c	52 ^c	56 ^c
Total ranks	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Arithmetic mean of negative ranks	26.31	26.31	28.00	26.67	26.01	26.89	27.79	27.48	27.07	26.01	12.50	4.43	11.00	17.30	15.17
Arithmetic mean of positive ranks	13.50	13.50	15.00	13.00	11.50	13.00	20.83	11.00	14.00	12.50	12.50	5.00	12.38	14.00	14.93
Sum of negative ranks	1157.50	1157.50	1288.00	1147.00	1118.50	1210.00	1306.00	1209.00	1191.00	1040.50	50.00	31.00	154.00	519.00	136.50
Sum of positive ranks	67.50	67.50	90.00	78.00	57.50	65.00	125.00	66.00	84.00	87.50	250.00	5.00	99.00	42.00	298.50
Test statistics: Z	-5.563 ^d	-5.563 ^d	-5.604 ^d	-5.435 ^d	-5.545 ^d	-5.647 ^d	-5.359 ^d	-5.636 ^d	-5.472 ^d	-5.163 ^d	-3.266 ^d	-1.829 ^d	-0.956 ^d	-4.395 ^d	-1.800 ^d
Asymp. Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.067	0.339	0.000	0.072

a. parameter of patient condition notes - After < parameter of patient condition notes - Before

b. parameter of patient condition notes - After > parameter of patient condition notes - Before

c. parameter of patient condition notes - After = parameter of patient condition notes - Before

d. values based on positive ranks

sis. Positive ranks describe parameter values which at result testing after thrombolysis were higher than parameter values before thrombolysis. With a 95% confidence level, a statistically significant difference ($p < 0.05$) was found for parameters of hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Braden scale and categorization, before and after thrombolytic therapy. Statistical significance was not found in the parameters of pain ($p = 0.067$), GCS/Trauma score scale ($p = 0.339$), risk of fall ($p = 0.072$).

By analysing the categorization of patients before ($\bar{x} = 3.28$) and after ($\bar{x} = 2.53$) thrombolytic therapy, it has been determined that there has been a decrease in the total categorization of patients, as demonstrated in Table 3.

Discussion

The scientific recommendation of *American Heart Association/ American Stroke Association*: "Scientific reasons for including and excluding criteria for intravenous alteplase in acute ischemic stroke" published in 2015 contains recommendations which additionally clarify the criteria for acceptability of rt-PA (alteplase) therapy in patients with acute ischemic stroke (27, 19).

The major advantage of thrombolysis is the improvement in the final functional outcome through reperfusion and salvation of the endangered tissue. Intracerebral haemorrhaging, which occurs in 6% of patients who have noticed deterioration after the administration of the drug, presents a major risk (28-31). In NINDS studies, the number of combinations of minor and major symptomatic intracerebral haemorrhaging, i.e. any clinical deteriorations which correspond in time with any new intracerebral haemorrhaging 24 to 36 hours after the treatment was 6.4% with rt-PA in relation to 0.6% without rt-PA (30-32). Intracerebral haemorrhaging can be signalled by acute hypertension, headache, neurological deterioration and nausea or vomiting. Other complications may include haemorrhaging from intravenous catheters and locations of earlier vein punctions (in 30% of the cases) (28-30).

Recombined tissue plasminogen activator, rt-PA, is administered in the dose of 0.9 mg/ kg of body mass, of which 10% initially as intravenous bolus and then the rest in a continued intravenous infusion in the course of one hour. Maximum drug dosage is 90 mg. Thrombolytic therapy has been used in the world for 20 years. At „Dr. Ivo Pedišić“ General Hospital, thrombolytic therapy has been used since 2012, when only one patient was administered the therapy. This study determined that the administration of thrombolytic therapy is on the rise year after year. In 2013 and 2014 there were only 13 thrombolytic therapies, in 2015 22 thrombolytic therapies were administered and in 2016 as many as 29. The study also

Table 3. Categorization of patients before and after thrombolytic therapy

Time	Category	N	%	\bar{x}	SD
Categorization - Before	1	0	0	3.28	0.67
	2	10	11.8		
	3	41	48.2		
	4	34	40.0		
	Total	85	100.0		
Categorization - After	1	18	21.2	2.53	1.12
	2	28	32.9		
	3	15	17.6		
	4	24	28.2		
	Total	85	100.0		

included the first five months of 2017 where thrombolytic therapy was administered to 8 patients. The average age of the patients who were administered thrombolytic therapy is 67.24 with standard deviation of 10.865 years. Minimum age is 25 and maximum age is 87. As regards gender distribution, there are 61.2% of male and 38.8 % of female patients.

As already mentioned, the study was conducted by insight into nursing documentation in the electronic form - comparison of patient condition notes before and after thrombolytic therapy. The following parameters were monitored: hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Glasgow coma scale (GCS)/Trauma score scale, Braden scale, risk of fall and total categorization. In order to establish potential differences among these parameters, Wilcoxon test was used, which confirmed a statistically relevant difference in almost all parameters of patient condition notes. By analysing categorization of patients, it is evident that before the administration of therapy 10 patients belonged to category II (11.8%), 41 patients to category III (48.21%) and 34 patients to category IV (40%). After the administration of thrombolytic therapy, an improvement is evident with: 18 patients in category I (21.2%), 28 patients in category II (32.9%), 15 patients in category III (17.6%), and 24 patients in category IV (28.2%). When searching the PubMed database for keywords *nursing*, *documentation*, *outcomes* and *thrombolysis*, not a single study was found which used data from nursing documentation, as did the study at hand. Grabowska and associates carried out a year-long prospective study which used different scales for the assessment of care outcomes and determined better outcomes of patient care and consequently a better quality of life after thrombolytic treatment. Throughout the course of one year 53 participants were assessed for NIHSS, Barthel index and quality of life scale for stroke patients. Beneficial outcomes after thrombolytic treatment were determined in all three scales. At hospital admission, 83 % of all patients had serious or moderate neurological damage. 74% reported acceptable level of quality of life three months after thrombolytic treatment and 79% 12 months after. The neurological status has been significantly improved with the most relevant changes during hospitalization - after thrombolytic treatment and in the first three months after discharge (31). Catanguí claims that nurses play a vital role in early detection of deteriora-

tion in patients' conditions, especially in recognizing harmful consequences of thrombolytic treatment (32). Nurses involved in the care of acute stroke patients must have ongoing education. The purpose of education is the development of skills required to treat patients who have suffered a stroke and expansion of knowledge in line with the latest medical developments for all types of stroke (33). Baatiema and associates conducted a study based on a systematic overview of databases MEDLINE, CINAHL, Embase, PsycINFO, Cochrane and AMED from 1990 to 2016 and established the main obstacles in the application of scientifically grounded care treatments in instances of acute stroke. Respondents in ten studies found in those databases were clinical healthcare workers in wards and units for acute stroke care. Result analysis established the major obstacles, namely poor work organization, limitations as regards staff competences, low level of awareness and knowledge of the effects of the scientifically founded administration of thrombolytic therapy, as well as inadequate support among healthcare staff (34). Active and effective nursing interventions in the first hours of acute stroke bring about an increase in therapy efficiency, i.e. recovery and rehabilitation. Catanguí and Roberts's study established that nurses are vital for a successful thrombolytic treatment, as they ease, facilitate, supervise and anticipate the course of thrombolytic treatment. They also claim that factors such as communication, teamwork, making clinical decisions, education and security affect and contribute to the success of thrombolytic treatment (35).

The implementation of the healthcare process, continued monitoring of the patient's condition and progress, as well as validation of nursing activities provide an imperative for the application of nursing documentation as an essential tool in describing regular nursing activities. Application of documentation enables a more permanent insight into a patient's general condition, data availability, care continuity, progress chronology and result evaluation, as well as a material background for professional, expert and scientific development of nurses through studies in the field of nursing.

The major limitation of this study was the time of data collected after the administered thrombolytic therapy. More precisely, the study considered relevant only the data entered into the electronic nursing documentation immediately before patients' discharge irrelevant of the duration of their hospital stay. Furthermore, an-

other limitation is the technical setup of the electronic nursing documentation, which, when entering data, records the current time of entering data in the system, and not the real time of administering treatments and procedures, meaning that the time difference may be up to a couple of hours.

Conclusion

Contemporary therapy for acute ischaemic stroke includes intravenously administered thrombolytic therapy - recombinant tissue plasminogen activator, but only within the first 180 i.e. 270 minutes of the stroke and insofar as NIHSS criteria are met. The objective of thrombolytic therapy is to re-establish circulation, i.e. reperfusion of the ischaemic area.

Nursing documentation is a set of data which serves for the purpose of quality control of planned and administered nursing care and is an integral part of the medical documentation of each patient. Nurses document every treatment from the field of healthcare and thus ensure the best possible outcome of nursing care for patients. As previously mentioned, time is a crucial factor when administering thrombolytic therapy. Prompt reaction and administering rt-PA within the recommended timeframe ensure a better outcome of patient care in total. Hence, nurses' interventions are vital and indispensable; they are aimed at quick assessment, high-quality organization within a multidisciplinary team and patient preparation for therapy, as well as adequate care after the administered thrombolytic therapy.

The study carried out established that there is a statistically relevant difference in care outcomes for patients after the administered thrombolytic therapy in relation to the time before thrombolytic therapy, in the following parameters of progress notes on patients' conditions: hygiene, feeding, elimination, dressing, walking, moving, sitting, standing, turning, nutrition - diet, strain tolerance, Braden scale and categorization.

Nurses involved in care of acute stroke patients must have ongoing education. The purpose of the education is the development of skills required to

treat patients who have suffered a stroke and expansion of knowledge in line with the latest medical developments for all types of stroke. New challenges are a good formal, but also lifelong education, as well as scientific research which must be grounded in evidence.

References

1. Andrija Stampar teaching institute of Public Health. World stroke day. Available from: <http://www.stampar.hr/hr/svjetski-dan-mozdanog-udara-29-listopada-2014-ja-sam-zena-mozdani-udar-pogada-i-mene> Accessed: 15.08.2017. Croatian.
2. Croatian Stroke Society. Available from: <http://www.croatianstrokesociety.org/> Accessed: 15.08.2017. Croatian.
3. Jones SP, Jenkinson AJ, Leathley MJ, Watkins CL. Stroke Knowledge and awareness: an integrative review of the evidence. *Age Ageing*. 2010;39(1):11-22.
4. Slark J, Sharma P. Risk awareness in secondary stroke prevention: a review of the literature. *JRSM Cardiovasc Dis*. 2014;3:1-6.
5. Stead LG, Vaidyanathan L, Bellolio MF, Kashyap R, Bhagra A, Gilmore RM, et al. Knowledge of signs, treatment and need for urgent management in patients presenting with an acute ischaemic stroke or transient ischaemic attack: a prospective study. *Emerg Med J*. 2008;25(11):735-9.
6. Pliva Health. Stroke. Available from: <http://www.pliva-zdravlje.hr/bolest-clanak/bolest/125/Mozdani-udar.html> Accessed: 25.11.2017. Croatian.
7. The World Health Organisation MONICA Project (monitoring trends and determinants in cardiovascular disease): a major international collaboration. WHO MONICA Project, Principal investigators. *J Clin Epidemiol*. 1988;41(2):105-14.
8. Antončić I, Dunatov S, Tuškan-Mohar L, Bonifačić D, Perković O, Sošić M. Sistemska tromboliza u liječenju akutnog ishemijskog moždanog udara. *Medicina fluminensis*. 2013;49(4):454-62. Croatian.
9. Bašić Kes V, Demarin V. Moždani udar. Zagreb: Medicinska naklada; 2014. Croatian.
10. Mojsović Z. Sestrinstvo u zajednici. Priručnik za studij sestrinstva-drugi dio. Zagreb: University of Applied Health Sciences; 2007. Croatian.
11. Koh KK, Mincemoyer R, Bui MN, Csako G, Pucino F, Guetta V, et al. Effects of hormone-replacement therapy on fibrinolysis in postmenopausal women. *N Engl J Med*. 1997;336(10):683-90.

12. Cote R, Wolfson C, Solymoss S, Mackey A, Leclerc JR, Simard D, et al. Hemostatic markers in patients at risk of cerebral ischemia. *Stroke Hemostatic markers in patients at risk of cerebral ischemia. Stroke.* 2000;31(8):1856-62.
13. Centers for Disease Control and Prevention. Stroke Fact Sheet. Available from: https://www.cdc.gov/dhdds/data_statistics/fact_sheets/docs/fs_strokesigns.pdf. Accessed: 14.08.2017.
14. Jauch EC. Acute Management of Stroke. Medscape. Available from: <http://emedicine.medscape.com/article/1159752-overview> Accessed: 16.08.2017.
15. Jauch EC, Saver JL, Adams HP, Bruno A, Connors JJ, Demaerschalk BM, et al. Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke.* 2013;44:870-947.
16. Benavente O, Hart RG. Stroke: Part II. Management of Acute Ischemic Stroke. *Am Fam Physician.* Available from: <http://www.aafp.org/afp/1999/0515/p2828.html> Accessed: 16.08.2017.
17. Adams HP, del Zoppo G, Alberts MJ, Bhatt DL, Brass L, Furlan A, et al. Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups: the American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists. *Circulation.* 2007;115(20):478-534.
18. National Institute of Neurological Disorders, Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. *N Engl J Med.* 1995;333(24):1581-7.
19. Hacke W, Donnan G, Fieschi C, Kaste M, von Kummer R, Broderick JP, et al. Association of outcome with early stroke treatment: pooled analysis of Atlantis, ECASS, and NINDS rt-PA stroke trials. *Lancet.* 2004;363(9411):768-74.
20. Saver JL, Kalafut M. Thrombolytic Therapy in Stroke. Available from: <http://emedicine.medscape.com/article/1160840-overview#showall> Accessed: 28.08.2017.
21. Chalela JA, Katzan I, Liebeskind DS, Rasmussen P, Zaidat O, Suarez JL, et al. Safety of intra-arterial thrombolysis in the postoperative period. *Stroke.* 2001;32(6):1365-9.
22. Hacke W, Kaste M, Bluhmki E, Brozman M, Dávalos A, Guidetti D, et al. Thrombolysis with alteplase 3 to 4.5 hours after acute ischemic stroke. *N Engl J Med.* 2008;359(13):1317-29.
23. Del Zoppo GJ, Saver JL, Jauch EC, Adams HP. Extension of the time window for treatment of acute ischemic stroke with intravenous tissue plasminogen activator: a science advisory from the American Heart Association/American Stroke Association. *Stroke.* 2009;40(8):2945-8.
24. Wahlgren N, Ahmed N, Dávalos A, Hacke W, Millán M, Muir K, et al. Thrombolysis with alteplase 3-4.5 h after acute ischaemic stroke: an observational study. *Lancet.* 2008;372(9646):1303-9.
25. Stujić V. Sestrinska dokumentacija. Sestrinski list KB Merkur. 2006;4:6. Croatian.
26. Šepec S, Kurtović B, Munko T, Vico M, Abou Aldan D, Babić D, et al. Sestrinske dijagnoze. Zagreb: Croatian Nursing Council; 2011. p.84-111. Croatian.
27. Demaerschalk BM, Kleindorfer DO, Adeoye OM, Demchuk AM, Fugate JE, Grotta JC, et al. Scientific Rationale for the Inclusion and Exclusion Criteria for Intravenous Alteplase in Acute Ischemic Stroke: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke.* 2016;47(2):581-641.
28. Graham GD. Tissue plasminogen activator for acute ischemic stroke in clinical practice: a meta-analysis of safety data. *Stroke.* 2003;34(12):2847-50.
29. Albers GW, Clark WM, Madden KP, Hamilton SA. Atlantis trial: results for patients treated within 3 hours of stroke onset. Alteplase Thrombolysis for Acute Noninterventional Therapy in Ischemic Stroke. *Stroke.* 2002;33(2):493-5.
30. Kopačević L, Jelačić D, Požgaj Š, Lovrenčić M, Halusek-Jakšić J, Mihulja L, et al. Team Approach in Providing Care for Stroke Patients. *Acta Clin Croat.* 2004;43(3):139-141. Croatian.
31. Grabowska-Fudala B, Jaracz K, Górna K, Jaracz J, Kaźmierski R. Clinical recovery and health-related quality of life in ischaemic stroke survivors receiving thrombolytic treatment: a 1-year follow-up study. *J Thromb Thrombolysis.* 2017;43(1):91-7.
32. Catanguí EJ. Thrombolysis for patients with acute ischaemic stroke. *Nurs Stand.* 2015;30(8):40-4.
33. Hacke W, Kaste M, Skyhoj Olsen T, Orgogozo JM, Bogousslavsky J. European Stroke Initiative (EUSI) recommendations for stroke management. The European Stroke Initiative Writing Committee. *Eur J Neurol.* 2000;7(6):607-23.
34. Baatiema L, Otim ME, Mnatzaganian G, de-Graft Aikins A, Coombes J, Somerset S. Health professionals' views on the barriers and enablers to evidence-based practice for acute stroke care: a systematic review. *Implement Sci.* 2017;12(1):74.
35. Catanguí EJ, Roberts CJ. The lived experiences of nurses in one hyper-acute stroke unit. *Br J Nurs.* 2014;23(3):143-8.

EVALUACIJA ISHODA SESTRINSKE SKRBI BOLESNIKA NAKON POSTUPKA TROMBOLIZE - RETROSPEKTIVNA STUDIJA

Sažetak

Uvod. Sestrinska dokumentacija pokazatelj je kvalitete zdravstvene njege. Analizom podataka, sestrinska dokumentacija postaje alat u procjeni i promjeni kliničke prakse. Moždani udar najveći je pojedinačni uzrok invaliditeta kod odrasle populacije. Kod ishemijskoga moždanog udara dolazi do naglog prekida moždane cirkulacije. Uzroci prekida cirkulacije mogu biti začepljenje ili suženje krvne žile uzrokovane trombozom, embolijom ili sustavnom hipoperfuzijom. U praksi se primjenjuje terapija za akutni ishemijski moždani udar koja uključuje intravensku primjenu trombolitičke terapije - rekombiniranoga tkivnog aktivatora plazminogena unutar prvih 180 odnosno 270 minuta od nastanka moždanog udara.

Cilj. Utvrditi ishode skrbi bolesnika nakon primjene trombolitičke terapije prikazom sažetka praćenja stanja bolesnika tijekom hospitalizacije, a u vremenu prije i nakon primijenjene trombolize.

Metode. Retrospektivna studija provedena je na odjelu neurologije u Općoj bolnici „Dr. Ivo Pedišić“ u Sisku kroz 43 mjeseca u periodu od 1. siječnja 2013. do 31. svibnja 2017. U provedenoj studiji sudjelovalo je 85 ispitanika. Podaci su prikupljeni na temelju sastavnice sestrinske dokumentacije u elektroničkom obliku: sažetka praćenja stanja bolesnika.

Rezultati. S razinom pouzdanosti od 95 % utvrđena je statistički značajna razlika ($p < 0,05$) kod parametara higijene, hranjenja, eliminacije, oblačenja, hodanja, premještanja, sjedanja, stajanja, okretanja,

prehrane - dijeta, podnošenja napora, Bradenove skale i kategorizacije, a prije i poslije trombolize. Statistička značajnost nije utvrđena kod parametara bol ($p = 0,067$), GCS / Trauma score ljestvice ($p = 0,339$) i rizik za pad ($p = 0,072$).

Zaključak. Primjena procesa zdravstvene njege, kontinuirano praćenje stanja bolesnika, ali i vrednovanje sestrinskog rada daje imperativ primjeni sestrinske dokumentacije kao važnom alatu za opis sestrinske prakse. Primjena dokumentacije omogućuje trajni uvid u stanje bolesnika, dostupnost podataka, kontinuitet skrbi, kronološki pregled i evaluaciju rezultata, kao i materijalnu podlogu za profesionalni, stručni i znanstveni razvoj medicinskih sestara kroz istraživanja u sestrinstvu.

Gljučne riječi: sestrinstvo, dokumentacija, ishodi, tromboliza
